CLAIMS

1. A method for forming a multi-carrier output signal for transmission in a communication system, the multi-carrier output signal being formed from a plurality of data signals each modulated with a respective one of a plurality of carrier signals, the method comprising:

establishing two or more sets of carrier signals, each set comprising each of the plurality of carrier signals and differing from the other set(s) in the phase of at least one of the carrier signals;

selecting the one of the sets of carrier signals that would, when used to form the multi-carrier signal, result in the multi-carrier output signal having the lowest maximum amplitude; and

forming the multi-carrier output signal from the plurality of data signals each modulated with the respective one of the plurality of carrier signals of that selected set.

2. A method as claimed in claim 1, comprising the step of determining the maximum amplitude of the multi-carrier output signal that would result from the use of a first set of carrier signals to form the multi-carrier signal, and if that maximum amplitude is above a predetermined threshold performing the said selecting and forming steps and otherwise forming the multi-carrier output signal from the plurality of data signals modulated with the respective one of the plurality of carrier signals of the first set.

3. A method as claimed in claim 1, wherein the said step of establishing comprises:

forming a first set of the plurality of carrier signals; and

forming the or each other set of the plurality of carrier signals by duplicating a previously formed set of the carrier signals but with the phase of one or more of the carrier signals altered by a random amount.

4. A method as claimed in claim 1, wherein the said step of establishing comprises:

forming a first set of the plurality of carrier signals; and

forming the or each other set of the plurality of carrier signals by duplicating a previously formed set of the carrier signals but with the phase of one or more of the carrier signals altered by a pre-determined amount.

5. A method as claimed in claim 4, wherein the pre-determined amount is selected from a set of predetermined amounts.

6. A method as claimed in claim 5, wherein the set of predetermined amounts comprises one or more of the values: $\pi/2$, π, $3\pi/2$.

7. A method as claimed in claim 1, wherein the said step of selecting comprises:

for each of the sets of carrier signals: forming a multi-carrier signal by modulating each of the data signals with the respective carrier signal of that set, combining the modulated signals and determining the maximum amplitude of the combined signal.

8. A method as claimed in claim 1, comprising repeatedly forming one of the said sets of carrier signals and determining the maximum amplitude that the multi-carrier output signal would have if that set of carrier signals were used to form the multi-carrier signal, until the determined maximum amplitude is below a predetermined threshold.

9. A method as claimed in claim 1, wherein the communication system is a GSM, WCDMA or EDGE communication system.

10. A method as claimed in claim 1, wherein the multi-carrier output signal is a burst of the communication system.

11. A method as claimed in claim 1, wherein each of the data signals comprises more than 100 symbols.

12. A method as claimed in claim 1, comprising amplifying the multi-carrier output signal and transmitting the amplified signal via an antenna.

13. A method as claimed in claim 12, where the signal is amplified by means of a linear power amplifier.

14. A transmitter for forming a multi-carrier output signal for transmission in a communication system, the multi-carrier output signal being formed from a plurality of data signals each modulated with a respective one of a plurality of carrier signals, the transmitter comprising:

means for establishing two or more sets of carrier signals, each set comprising each of the plurality of carrier signals and differing from the other set(s) in the phase of at least one of the carrier signals;

means for selecting the one of the sets of carrier signals that would, when used to form the multi-carrier signal, result in the multi-carrier output signal having the lowest maximum amplitude; and

means for forming the multi-carrier output signal from the plurality of data signals each modulated with the respective one of the plurality of carrier signals of that selected set.

15. A transmitter for forming a multi-carrier output signal for transmission in a communication system, the multi-carrier output signal being formed from a plurality of data signals each modulated with a respective one of a plurality of carrier signals, the transmitter being configured to:

establish two or more sets of carrier signals, each set comprising each of the plurality of carrier signals and differing from the other set(s) in the phase of at least one of the carrier signals;

select the one of the sets of carrier signals that would, when used to form the multi-carrier signal, result in the multi-carrier output signal having the lowest maximum amplitude; and

form the multi-carrier output signal from the plurality of data signals each modulated with the respective one of the plurality of carrier signals of that selected set.

16. A method for forming a multi-carrier output signal for transmission in a communication system, the multi-carrier output signal being formed from a plurality of data signals each modulated with a respective one of a plurality of carrier signals, the method comprising:

establishing a set of carrier signals;

determining the maximum amplitude of the multi-carrier signal that would result from modulating each of the plurality of data signals with the respective one of the plurality of carrier signals of that set; and

if the determined maximum amplitude is below a pre-determined threshold, forming the multi-carrier signal by modulating each of the plurality of data signals with the respective one of the plurality of carrier signals of that set; and otherwise;

altering the phase of at least one of the carrier signals of the set, and forming the multi-carrier signal by modulating each of the plurality of data signals with the respective one of the plurality of carrier signals of the set, including the at least one carrier signal having an altered phase.